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**NOTICE OF
CHANGE**

**NOT MEASUREMENT
SENSITIVE**

**MIL-STD-2500A
NOTICE 2
(TBD)**

**DEPARTMENT OF DEFENSE
INTERFACE STANDARD**

**NATIONAL IMAGERY TRANSMISSION FORMAT (VERSION 2.0)
FOR THE NATIONAL IMAGERY TRANSMISSION FORMAT STANDARD**

TO ALL HOLDERS OF MIL-STD-2500A:

1. THE FOLLOWING PAGES OF MIL-STD-2500A HAVE BEEN REVISED AND SUPERSEDE THE PAGES LISTED:

NEW PAGE	DATE	SUPERSEDED PAGE	DATE
cover	TBD	cover	reprinted without change
ii	TBD	ii	7 February 1997
v	TBD	v	reprinted without change
vi	TBD	vi	12 October 1994
19	TBD	19	12 October 1994
20	TBD	20	12 October 1994
21	TBD	21	12 October 1994
22	TBD	22	12 October 1994
39	TBD	39	reprinted without change
40	TBD	40	12 October 1994
83	TBD	83	reprinted without change
84	TBD	84	12 October 1994
84a	TBD	not applicable	new page
84b	TBD	not applicable	new page
DD1426	TBD	DD1426	7 February 1997

2. RETAIN THIS NOTICE AND INSERT BEFORE TABLE OF CONTENTS.

3. Holders of MIL-STD-2500A will verify that the page changes and additions indicated above have been entered. This notice page will be retained as a check sheet. This issuance, together with appended pages, is a separate publication. Each notice is to be retained by stocking points until the military standard is completely revised or canceled.

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(Project INST-000204)

NOTE: The cover page of this standard has been changed for administrative reasons. There are no other changes to this document.

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MIL-STD-2500A
12 October 1994
SUPERSEDING
MIL-STD-2500
18 June 1993

DEPARTMENT OF DEFENSE INTERFACE STANDARD

NATIONAL IMAGERY TRANSMISSION FORMAT STANDARD
(VERSION 2.0)
FOR THE
NATIONAL IMAGERY TRANSMISSION FORMAT STANDARD



AMSC N/A

AREA INST

FOREWORD

REPRINTED WITHOUT CHANGE.

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NOTICE 2

1. The National Imagery Transmission Format Standard (NITFS) is the standard for formatting digital imagery and imagery-related products and exchanging them among members of the Intelligence Community (IC) as defined by the Executive Order 12333, the Department of Defense (DOD), and other departments and agencies of the United States Government, as governed by Memoranda of Agreement (MOA) with those departments and agencies.
2. The NITFS Technical Board (NTB) developed this standard based upon currently available technical information.
3. The DOD and members of the Intelligence Community are committed to interoperability of systems used for formatting, transmitting, receiving, and processing imagery and imagery-related information. This standard describes the National Imagery Transmission Format (NITF) file format and establishes its application within the NITFS.
4. Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to National Imagery and Mapping Agency, SEII, ~~14675 Lee Road, Chantilly, VA 20151-1715~~ 4600 Sangamore Road, Bethesda, MD 20816-5003 by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

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5.2.1 Incomplete Header. Several length fields in the file header are needed to parse the file. They contain the lengths of specific components of the file (i.e., HL through LDnnn). In some operational circumstances (e.g., those with critical time or storage constraints) all the information needed to populate the header fields may not be available at the start of file creation. If all the fields in the file header cannot be filled with valid data, a special Reserved Extension Segment (see 5.10) shall be used to provide the data needed to complete the file header. Incomplete length fields shall be filled with a leading minus (0x2D) and the appropriate number of "0" characters (0x30) as place holders. A system receiving a file with an incomplete header shall locate the reserved extension and interpret the data in the Reserved Extension Segment as though it is actually located at the beginning of the file. As an option, it may re-store the file header fragment from the RES to populate the header. Any modification of this file shall result in the file being stored with a fully compliant header.

TABLE I. NITF file header

(R) = required, (O) = optional, and (C) = conditional

FIELD	NAME	SIZE	VALUE RANGE	TYPE
FHDR	File Type & Version	9	NITFNN.NN	R
CLEVEL	Compliance Level	2	1-99	R
STYPE	System Type	4	Reserved	O
OSTAID	Originating Station ID	10	Alphanumeric	R
FDT	File Date & Time	14	DDHHMMSSZMONYY	R
FTITLE	File Title	80	Alphanumeric	O
FSCLAS	File Security Classification	1	T, S, C, R, or U	R
FSCODE	File Codewords	40	Alphanumeric	O
FSCTLH	File Control and Handling	40	Alphanumeric	O
FSREL	File Releasing Instructions	40	Alphanumeric	O
FSCAUT	File Classification Authority	20	Alphanumeric	O
FSCTLN	File Security Control Number	20	Alphanumeric	O
FSDWNG	File Security Downgrade	6	Alphanumeric	O
FSDEVT	File Downgrading Event	40	Alphanumeric	C
FSCOP	Message Copy Number	5	0-99999	O
FSCPYS	Message Number of Copies	5	0-99999	O
ENCRYP	Encryption	1	0=Not Encrypted 1=Encrypted	R
<u>FBKGC</u>	<u>File Background Color</u>	<u>3</u>	<u>Unsigned Binary Integer</u> <u>(0x00-0xFF, 0x00-0xFF, 0x00-</u> <u>0xFF) (Default is Not</u> <u>Applicable)</u>	R

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TABLE I. NITF file header - Continued.

(R) = required, (O) = optional, and (C) = conditional

FIELD	NAME	SIZE	VALUE RANGE	TYPE
ONAME	Originator's Name	274	Alphanumeric	O
OPHONE	Originator's Phone Number	18	Alphanumeric	O
FL	File Length	12	0-999999999999	R
HL	NITF File Header Length	6	0-999999	R
NUMI	Number of Images	3	0-999	R
LISH001	Length of 1 st Image Subheader	6	0-999999	C
LI001	Length of 1 st Image	10	0-9999999999	C
.....				
LISHnnn	Length of N th Image Subheader	6	0-999999	C
LInnn	Length of N th Image	10	0-9999999999	C
NUMS	Number of Symbols	3	0-999	R
LSSH001	Length of 1 st Symbol Subheader	4	0-9999	C
LS001	Length of 1 st Symbol	6	0-999999	C
.....				
LSSHnnn	Length of N th Symbol Subheader	4	0-9999	C
LSnnn	Length of N th Symbol	6	0-999999	C
NUML	Number of Labels	3	0-999	R
LLSH001	Length of 1 st Label Subheader	4	0-9999	C
LL001	Length of 1 st Label	3	0-320	C
.....				
LLSHnnn	Length of N th Label Subheader	4	0-9999	C
LLnnn	Length of N th Label	3	0-320	C
NUMT	Number of Text Files	3	0-999	R
LTSH001	Length of 1 st Text Subheader	4	0-9999	C
LT001	Length of 1 st Text File	5	0-999999	C
.....				
LTSHnnn	Length of N th Text Subheader	4	0-9999	C

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TABLE I. NITF file header - Continued.

(R) = required, (O) = optional, and (C) = conditional

FIELD	NAME	SIZE	VALUE RANGE	TYPE
LTnnn	Length of N th Text File	5	0-99999	C
NUMDES	Number of Data Extension Segments	3	0-999	R
LDSH001	Length of 1 st Data Extension Segment Subheader	4	0-9999	C
LD001	Length of 1 st Data Extension Segment Data Field	9	0-999999999	C
.....				
LDSHnnn	Length of n th Data Extension Segment Subheader	4	0-9999	C
LDnnn	Length of n th Data Extension Segment Data Field	9	0-999999999	C
NUMRES	Number of Reserved Extension Segments	3	0-999	R
LRSH001	Length of 1 st Reserved Extension Segment Subheader	4	0-9999	C
LR001	Length of 1 st Reserved Extension Segment Data Field	7	0-9999999	C
.....				
LRSHnnn	Length of n th Reserved Extension Segment Subheader	4	0-9999	C
LRnnn	Length of n th Reserved Extension Segment Data Field	7	0-9999999	C
UDHDL	User Defined Header Data Length	5	0-99999	R
UDHOFL	User Defined Header Overflow	3	0-999	C
UDHD	User Defined Header Data	*	Registered Tagged Record Extensions	C
XHDL	Extended Header Data Length	5	0-99999	R
XHD	Extended Header Data	**	Controlled Tagged Record Extensions	C

* As specified in UDHDL

** As specified in XHDL

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TABLE II. NITF file header fields.

FHDR	An ASCII character string of the form NITFNN.NN, which indicates this file is formatted using version NN.NN of NITF. The valid values for this field are NITF01.10 and NITF02.00.
CLEVEL	This field shall contain the compliance level required to interpret fully all components of the file. Valid entries are integer values 01 through 067 and 99 and are assigned in accordance with certification requirements established in JIEO Circular 9008. Values 00, and 078 through 98 are reserved for future use.
STYPE	System type or capability. This field is reserved for future use and shall be filled with spaces (ASCII 32, decimal).
OSTAID	This field shall contain the identification code of the originating station.
FDT	This field shall contain the time (Zulu) of the files origination in the format DDHHMMSSZMONYY, where DD is the day of the month (01-31), HH is the hour (00-23), MM is the minute (00-59), SS is the second (00-59), the character Z is required, MON is first three characters of the month; and YY is the last two digits of the year.
FTITLE	This field shall contain the title of the NITF file.
FSCLAS	This field shall contain a valid value representing the classification level of the entire file. Valid values are T (=Top Secret), S (=Secret), C (=Confidential), R (= Restricted), U (=Unclassified).
FSCODE	This field shall contain a valid indicator of the security compartments associated with the file. Valid values are one or more of the following separated by single spaces (ASCII 32, decimal) within the field: digraphs in accordance with table V, trigraphs not contained in table V, and complete codewords or project numbers. The selection of a relevant set of codewords and project numbers is application specific. If this field is all spaces, it shall imply that no codewords apply to the file.
FSCTLH	This field shall contain valid security handling instructions associated with the file. Valid values are one or more of the following separated by single spaces (ASCII 32, decimal) within the field: digraphs in accordance with table V, trigraphs not contained in table V, complete codewords or project numbers, complete words and abbreviations of more than two characters, phrases only if the words within the phrase are separated by hyphens. The selection of a relevant set of security handling instructions is implementation specific. If this field is all spaces, it shall imply that no file control and handling instructions apply.

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TABLE IV. NITF image subheader fields - Continued

.....	
ICOMnn	This field shall contain the nn th line of comment text, for $1 < nn \leq$ value in the NICOM field. See description of ICOM1 for usage. This field shall be omitted if the value in the NICOM field is zero.
IC	This field shall contain a valid code indicating the form of compression used in representing the image data. Valid values for this field are C0, to mean compressed with a user specified algorithm, C1 to mean bi-level, C2 to mean ARIDPCM, C3 to mean JPEG, C4 to mean Vector Quantization and NC to mean the image is not compressed. Also valid are the codes M0, M3 and M4 for compressed images, and NM for uncompressed images, indicating a blocked image that contains a block mask and/or a transparent pixel mask. The format of a mask image is identical to the format of its corresponding non-masked image, except for the presence of an Image Data Mask Subheader at the beginning of the image data area. The format of the Image Data Mask Subheader is described in 5.5.1.5 and is shown in Table IV(A). The definitions of the compression schemes associated with codes C1, C2, C3, and C4 are given, respectively, in MIL-STD-188-196, MIL-STD-188-197A, MIL-STD-188-198A, and MIL-STD-188-199. This field shall not contain C1 or C2 if NBANDS > 1 or NBLOCKS > 1.

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TABLE IV. NITF image subheader fields - Continued

COMRAT	<p>If the Image Compression (IC) field contains C0, C1, C2, C3, C4, M0, M3, or M4, this field shall be present and contain a code indicating the compression rate for the image. If the value in IC is C0 or M0, the code shall be user defined but shall not be all blanks. If the value in IC is C1 or M1, the valid codes are 1D, 2DS, and 2DH, where:</p> <p style="padding-left: 40px;">1D means one Dimensional Coding, 2DS means two Dimensional Coding Standard Vertical Resolution, K=2 2DH means two Dimensional Coding High Vertical Resolution, K=4</p> <p><u>A "0" (zero) will be used for the Y value when custom Q-Tables are used</u> Explanation of these codes can be found in MIL-STD-188-196. If the value in IC is C2 or M2, this field shall contain a value given in the form n.nn representing the number of bits-per-pixel for the compressed image. Explanation of the compression rate for vector quantization can be found in MIL-STD-188-199. Valid codes in this case are 0.75, 1.40, 2.30, and 4.50. Explanation of these codes can be found in MIL-STD-188-197A. If the value in IC is C3 or M3, this field is used to identify the default quantization table(s) used by the JPEG compression algorithm. In this case, the format of this field is XX.Y where XX is the image data type (00 = general purpose, 01 through 99 are reserved), and Y represents the quality level 1 through 5. Explanation of these codes can be found in MIL-STD-188-198A. If the value in IC is C4 or M4, this field shall contain a value given in the form n.nn representing the number of bits-per-pixel for the compressed image. Explanation of the compression rate for vector quantization can be found in MIL-STD-188-199. This field is omitted if the value in IC is NC or NM.</p>
NBANDS	<p>This field shall contain the number of bands comprising the image. This field and the IREP field are interrelated and independent of the IMODE field. The corresponding values for (IREP, NBANDS) are (MONO, 1); (RGB, 3); (RGB/LUT, 1); (YCbCr601, 3); (MULTI, 2-9).</p>
IREPBAND1	<p>When NBANDS contains the value one, this field shall contain all spaces. In all other cases, this field shall contain a valid indicator of the interpretation of the first band. Valid values are R, G, and B when IREP contains RGB; the band number is a positive integer when IREP contains MULTI. In all other cases, the use of this field is user-defined. However, its purpose is to provide the significance of the first band of the image with regard to the general image type as recorded in IREP. The significance of each band in the image can be derived from the combination of the IREP, IREPBANDnn and ICAT and ISUBCATnn fields.</p>
ISUBCAT1	<p>The use of this field is user-defined. Its purpose is to provide the significance of the first band of the image with regard to the specific category, ICAT, of the overall image. An example would be the wavelength of IR imagery.</p>

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TABLE XVII. Data extension segment subheader format

(R) = required, (O) = optional, and (C) conditional

FIELD	NAME	SIZE	VALUE RANGE	TYPE
DE	File Part Type	2	DE	R
DESTAG	Unique DES type identifier	25	Alphanumeric	R
DESVR	Version of the data field definition	2	1 to 99	R
DESSG	Security group	†	(See Table XVIII)	R
DESOFLW	Overflowed header type	6	Alphanumeric	C
DESITE	Data item overflowed	3	0 to 999	C
DESSHL	Length of user-defined subheader fields	4	0-9999	R
DESSH	User-defined subheader fields	*	Alphanumeric	C
DESDATA	User-defined data field	**	User defined	R

† 167 or 207 - table XVIII for explanation

* Value specified in DESSHL

** Determined by user. If DESTAG = "Registered Extensions" or "Controlled Extensions," this signifies the sum of the lengths of the included tagged records.

TABLE XVIII. Data extension segment subheader field definitions

FIELD	VALUE DEFINITIONS AND CONSTRAINTS
DE	This field shall contain the characters "DE" to identify the subheader as a data extension.
DESTAG	This field shall contain a valid alphanumeric identifier properly registered with the NTB.
DESVR	This field shall contain the alphanumeric version number of the use of the tag. The NTB assigns the version number as part of the registration process.
DESSG	This field shall contain a series of fields containing security classification information for the DES as a whole. The fields included shall mirror those of the NITF file header from FSCLAS through FSDEVT, including field length and content, but be applicable to the DES only. The field names shall be DESCLAS through DESDEVT respectively, simply substituting "DE" for "F." The number of bytes consumed by this field group will be 167 or 207, depending on whether the conditional DESDEVT field is present.

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TABLE XVIII. Data extension segment subheader field definitions - Continued

DESOFW	This field shall be present if DESTAG = "Registered Extensions" or "Controlled Extensions." Its presence indicates that the DES contains a tagged record extension that would not fit in the file header or component header where it would ordinarily be located. Its value indicates the data type to which the enclosed tagged record is relevant. If the value of DESTAG is "Controlled Extensions," the valid values for DESOFLW are XHD, IXSHD, SXSHD, LSXHD or TXSHD. If the value of DESTAG is "Registered Extensions," the valid values for DESOFLW are UDHD and UDID.
DESITEM	This field shall be present if DESOFLW is present. It shall contain the number of the data item in the file, of the type indicated in DESOFLW to which the tagged record extensions in the segment apply. For example, if DESOFLW = UDID and DESITEM = 3, then the tagged record extensions in the segment applies to the third image in the file. If the value of DESOFLW = UDHD, the value of DESITEM shall be 0.
DESSL	This field shall contain the number of bytes in the field DESSH. If this field contains 0, DESSH shall not appear in the DES subheader. This field shall contain 0 if DESTAG = "Registered Extensions" or "Controlled Extensions".
DESSH	This field shall contain user-defined fields. Data in this field shall be alphanumeric, formatted according to user specification.
DESDATA	This field shall contain data of either binary or character types defined by and formatted according to the user's specification. However, if the DESTAG is "Registered Extensions" or "Controlled Extensions," the tagged records shall appear according to their definition with no intervening bytes. The length of this field shall not cause any other NITF field length limits to be exceeded, but is otherwise fully user-defined.

5.9.2 Reserved extension segments. Structure is provided in the NITF file header to support up to 999 distinct fields of up to 9999999 bytes plus a corresponding subheader of up to 9999 bytes for each field. The combination of each subheader and corresponding data field is called a Reserved Extension Segment. These fields are reserved in that they shall not be present in any header until this standard is modified to define their use. See the definition of the field NUMRES and following field in tables II and III.

5.10 Corrected File Header Reserved Extension Segment The Reserved Extension Segment defined in tables XVIII(A) and XVIII(B) contains the replacement file header values described in 5.2.1. The CFHDR field of this segment shall contain a new version of the file's beginning. A system encountering incomplete file header fields (see 5.2.1) shall update the stored file by locating this segment at or near the end of the file and using the updated header values as if they were in the file header. Two unique delimiter fields straddle the characters of the replacement header to facilitate locating this segment by searching the area near the file end in either the forward or reverse direction. To ensure that valid delimiters are found (rather than data containing similar values), the RESCHL length field is repeated and located adjacent to each delimiter; their contents, and the number of characters between the delimiters must all agree. The segment may contain a complete file header, a subset of the file header, or may extend beyond the file header to include fields within the subsequent subheader.

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TABLE XVIII(A). Replacement File Header RES subheader format
(R) = required, (O) = optional, and (C) conditional

	<u>FIELD</u>	<u>NAME</u>	<u>SIZE</u>	<u>VALUE RANGE</u>	<u>TYPE</u>
<u>S</u>	<u>RE</u>	<u>File Part Type</u>	<u>2</u>	<u>RE</u>	<u>R</u>
<u>H</u>	<u>RESID</u>	<u>Unique RES type identifier</u>	<u>25</u>	<u>"Replacement File Header "</u>	<u>R</u>
<u>D</u>	<u>RESVER</u>	<u>Version of the data field definition</u>	<u>2</u>	<u>01</u>	<u>R</u>
<u>R</u>	<u>RESSG</u>	<u>Security Group.</u>	<u>167</u>	<u>(See table A-1, FSCLAS through FSDWNG)</u>	<u>R</u>
	<u>RESSHL</u>	<u>Length of user-defined Subheader Fields</u>	<u>4</u>	<u>0000</u>	<u>R</u>
<u>D</u>	<u>CFH-L</u>	<u>Length of CFH-DR field</u>	<u>7</u>	<u>0 - 9999999</u>	<u>R</u>
<u>A</u>	<u>CFH-DELIM1</u>	<u>Unique delimiter 1</u>	<u>4</u>	<u>0x0A6E1D97</u>	<u>R</u>
<u>T</u>	<u>CFH-DR</u>	<u>Replacement Data</u>	<u>**</u>		<u>R</u>
<u>A</u>	<u>CFH-DELIM2</u>	<u>Unique delimiter 2</u>	<u>4</u>	<u>0x0ECA14BF</u>	<u>R</u>
	<u>CFH-L</u>	<u>Length of CFH-DR field</u>	<u>7</u>	<u>0 - 9999999</u>	<u>R</u>

**As specified in CFH-DR

TABLE XVIII(B). Replacement File Header RES subheader field definitions.

<u>FIELD</u>	<u>VALUE DEFINITIONS AND CONSTRAINTS</u>
<u>RE</u>	<u>This field shall contain the characters "RE" to identify the subheader as a reserved extension.</u>
<u>RESID</u>	<u>This field shall contain "Replacement File Header " (without the quotes).</u>
<u>RESVER</u>	<u>This field shall contain 01, the version number of this definition.</u>
<u>RESSG</u>	<u>This field shall contain a series of fields containing security classification information for the DES as a whole. The fields included shall mirror those of the NITF file header from FSCLAS through FSDWNG, including the field length and content, but be applicable to the RES only. The field names shall be RESCLAS through RESDEVT respectively, simply substituting "RE" for "F."</u>
<u>RESSHL</u>	<u>This field shall contain 0000.</u>
<u>CFH-L</u>	<u>This field shall contain the number of bytes in the field CFHDR.</u>
<u>CFH-DELIM1</u>	<u>This field shall contain the hexadecimal value 0x0A6E1D97. It provides a unique value that can be identified as the beginning of the replacement data.</u>

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TABLE XVIII(B). Replacement File Header RES subheader field definitions - Continued.

<u>FIELD</u>	<u>VALUE DEFINITIONS AND CONSTRAINTS</u>
<u>CFHDR</u>	<u>This field shall contain the byte string replacement for the file header beginning with the FHDR field and continuing for the number of bytes indicated in CFH-L. The file header replication shall at least continue through all the file header fields that are marked for correction.</u>
<u>CFH- DELIM2</u>	<u>This field shall contain the hexadecimal value 0x0ECA14BF. It provides a unique value that can be identified as the end of the replacement data.</u>
<u>CFH-L</u>	<u>A repeat of CFH-L, this field shall contain the number of bytes in the field CFHDR.</u>

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The preparing activity must complete blocks 1,2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7.
3. The preparing activity must provide a reply within 30 days from receipt of the form.

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I RECOMMEND A CHANGE:

1. DOCUMENT NUMBER
MIL-STD-2500A

2. DOCUMENT DATE (YYMMDD)
941012

3. DOCUMENT TITLE

NATIONAL IMAGERY TRANSMISSION FORMAT (VERSION 2.0)

4. NATURE OF CHANGE *(Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)*

5. REASON FOR RECOMMENDATION

6. SUBMITTER

a. NAME *(Last, First, Middle Initial)*

b. ORGANIZATION

c. ADDRESS *(Include Zip Code)*

d. TELEPHONE *(Include Area Code)*

7. DATE SUBMITTED
(YYMMDD)

(1) Commercial

(2) AUTOVON *(If applicable)*

8. PREPARING ACTIVITY **NATIONAL IMAGERY AND MAPPING AGENCY (NIMA)**

a. NAME

SEI Danny Rajan

b. TELEPHONE *(Include Area Code)*

(1) Commercial **(703) 808-0888** (2) AUTOVON

(301) 227-5337

c. ADDRESS *(Include Zip Code)*

SESR

44675 Lee Road 4600 Sangamore Road

Chantilly, VA 20151-1715 Bethesda, MD 20816-5003

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CONTACT:**

Defense Quality and Standardization Office

5203 Leesburg Pike, Suite 1403, Falls Church, VA 22041-3466

Telephone (703) 756-2340

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